

What is claimed is:

1. A test and measurement instrument, comprising:  
circuitry for entering parameters to be used to detect violations of predetermined  
parameters;  
5      a data acquisition unit for acquiring a signal on a first channel;  
processing circuitry for processing said signal;  
display circuitry for displaying a waveform representation of said signal;  
a reference memory for storing a first reference waveform;  
comparing circuitry for repeatedly comparing said stored first reference waveform to  
10     portions of said signal for detecting the existence of one of said violations by moving said  
reference waveform along said signal in time; and  
circuitry for alerting a user when one of said violations is detected.
2. The test and measurement instrument of claim 1, wherein:  
15     said comparison between said signal and said stored waveform occurs in real time as the  
signal is acquired.
3. The test and measurement instrument of claim 2, wherein  
said reference memory stores a second reference waveform; and  
20     said comparing circuitry repeatedly compares said first and second reference waveforms  
to said portions of said signal for detecting one of said violations.
4. The test and measurement instrument of claim 3, further including:  
circuity for selecting portions of a reference signal under user control, and storing a first  
25     selected portion in said reference memory as said first reference waveform, or storing a second  
selected portion in said reference memory as said second reference waveform, or both.
5. The test and measurement circuitry of claim 1, wherein:  
said predetermined parameters are defined by a user in terms of number of active gates,  
30     gate position, gate width, and tolerance.

6. The test and measurement instrument of claim 1, further including:  
a signal memory for storing a long record length signal; and  
said signal is a long record length stored signal, and said comparison is a comparison  
5 between said long-record length stored signal and said waveform occurring as said long record  
length signal is read out from said signal memory.

7. The test and measurement instrument of claim 4, wherein  
said reference memory stores a second reference waveform; and  
10 said comparing circuitry repeatedly compares said first and second reference waveforms  
to said portions of said long-record length stored signal for detecting one of said violations.

8. The test and measurement instrument of claim 1, wherein said reference  
wave form is defined by positioning a gate on a reference signal, and said gate is  
positioned by user adjustment of a gate positioning control displayed on said display  
15 screen.

9. The test and measurement instrument of claim 8, wherein said gate  
positioning control is a slider control displayed on said display screen.  
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10. A method for comparing a stored waveform to a received signal,  
comprising the steps of:  
entering parameters to be used to detect violations of predetermined parameters;  
acquiring a signal on a first channel;  
25 processing said signal in processing circuitry;  
displaying a waveform representation of said signal on a display device;  
storing a first reference waveform in a reference memory;  
repeatedly comparing said stored first reference waveform to portions of said signal for  
detecting the existence of one of said violations by moving said reference waveform along said  
30 signal in time; and  
alerting a user upon detecting one of said violations.

11. The method of claim 10, wherein:  
said step of repeatedly comparing occurs in real time as said signal is acquired.  
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12. The method of claim 11, further comprising the steps of:  
storing a second reference waveform in said reference memory; and  
repeatedly comparing said first and second reference waveforms to said portions of said  
5 signal for detecting one of said violations.

13. The method of claim 12, further including:  
circuitry for selecting portions of a reference signal under user control, and storing a first  
selected portion in said reference memory as said first reference waveform, or storing a second  
10 selected portion in said reference memory as said second reference waveform, or both.

14. The method of claim 10, wherein:  
said predetermined parameters are defined by a user in terms of number of active gates,  
gate position, gate width, and tolerance.  
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15. The method of claim 10, further including the steps of:  
storing said signal in a long record length signal memory, said signal being a long  
record length signal;  
reading out said long record length signal from said signal memory; and  
20 repeatedly comparing successive portions of said long record length stored signal to said  
waveform to detect one of said violations.

16. The method of claim 15, further including the steps of:  
storing a second reference waveform in said reference memory; and  
25 repeatedly comparing said first and second reference waveforms to said successive  
portions of said long record length stored signal to detect one of said violations.

17. The method of claim 8, and further including the step of:  
positioning a gate on a reference signal to define said reference wave form, said gate  
30 being positioned by user adjustment of a gate positioning control displayed on said  
display screen.